

Remarks

The Office Action dated February 5, 2007 has been carefully considered. The Attorney for the Applicant wishes to thank Examiner Bernshteyn for the courteous and helpful interview of March 9, 2007. Favorable reconsideration of the claims in the present application is respectfully requested.

During the March 9, 2007 telephonic interview with Examiner Bernshteyn, Claim 1 and the prior art were discussed, including the differences between claim 1 and the prior art. No conclusion or agreement was reached during the Interview.

This response is submitted in accordance with 37 CFR 1.116(a) and 1.116(b) in order to present the rejected claims in a better form for allowance or appeal. The amendments to Claims 1-7 and 27 are necessary to overcome the rejection of the claims in the Office Action. These amendments should be entered because it places the application in better form for allowance or appeal, and the amendments do not require further searching or present any new issues.

Claim 1 is rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 has been amended to delete the term substantial, making the rejection moot. Withdrawal of this rejection is requested.

Claims 1-7, 17-19, 21, and 27 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ito et al (US Patent 5,439,993) in view of Burgert et al. (US 5,629,377) for the reasons set forth in the Office Action of April 13, 2006.

The present invention, as set forth in the current claims, is directed to a process of making superabsorbent polymer including the steps of adding a chlorine- or bromine-containing oxidation agent to the monomer solution or hydrogel, polymerizing the monomer to form a crosslinked hydrogel, adding from about 1 to about 3 ppm, based on the weight of monomers (a), (b), and (c), of Fe(II) ions or Fe(III) ions, or a mixture of both, either to the monomer solution, or to the hydrogel prior to, during or after the comminution step (II) but prior to drying of the hydrogel in step (III), drying the hydrogel particles to form dried water-absorbent polymer particles and heat treating the dried water-absorbent polymer particles. Hydrogel is defined in the application to mean water swollen water absorbent polymer or polymer particles. Therefore hydrogel does not mean acrylic acid or other monomer.

As discussed during the telephone interview of March 9, 2007, Burgert et al. teaches a method for preparing water-absorbent polymers by polymerizing acrylic monomers in the presence of bromine- or chlorine-containing oxidizing agents and having low residual monomer. Burgert et al. discloses that his process requires drying the hydrogel at a temperature of less than 180°C, and heat treating the polymer particles at a temperature of from 170°C to 250°C for from 1 to 60 minutes, and that this process advantageously reduces residual monomer levels without significantly reducing the absorption capacity of absorption capacity under load of the polymer. See Burgert et al. at column 4, lines 6-11. Burgert et al. contains no teaching regarding further reduction of the residual monomer, or adding a very small amount of Fe(II) ions or Fe(III) ions to the monomer or to the hydrogel prior to, during or after the comminution step but prior to drying of the hydrogel mixture.

Ito et al. fails to suggest any reason for using iron ions in a water-absorbent polymer for the purpose or changing the residual amount of monomer and fails to suggest any reason that one would use iron ions in combination with the disclosure of Burgert et al. Ito et al. discloses the preparation of water-absorbent polymers by polymerizing acrylic monomers in the presence of certain metallic salts. In addition, Ito et al. fails to disclose the formation of a hydrogel since it is directed to reverse suspension polymerization, which includes formation of particles directly from the polymerization step and does not include forming a hydrogel as set forth in the present invention. Furthermore, Ito et al. discloses that the improved properties result from the surface treatment of the SAP particles with silane. Ito et al. does not disclose any properties related to the metallic salts to the monomer. Ito et al. does not disclose or suggest any reason that would suggest adding Fe(II) or Fe(III) ions to water-absorbent polymer composition. In fact, the disclosure of Ito et al. teaches away from the purpose of the use of the metallic salts in Ito et al., in which they are added to the monomer with polymerization purposes. In addition, Ito et al. does not disclose or suggest any reasons for adding the iron metals except for the polymerization of the monomer.

Adding Fe(II) or Fe(III) ions to water-absorbent polymer composition as set forth in the present invention resulted in unexpected results. The following table shows the unexpected results of the present invention not suggested by either Ito et al. or Burgert et al. As shown in the following table, the Examples in the present invention clearly show the reduction in the residual monomer when compared to Burgert et al. Examples 5b, 10b, and 18b reflect the residual monomer resulting from following the Burgert et al. reference. Examples 1b, 2b, 6b, 7b, and 14b reflect the residual monomer when iron is added during the process. The % reduction in residual

monomer as compared to water-absorbent polymer not containing the iron ranges from about 15 to about 46%.

Source	Ex	Iron Level [ppm bo acrylic acid]	Residual Monomer [ppm, bo dry polymer]	% reduction in residual monomer
Table 1	5b (Comp)	0.0	570	n/a
Table 1	1b	1.0	453	20
Table 1	2b	3.0	304	46
Table 2	10b (Comp)	0.0	306	n/a
Table 2	6b	2.0	266	15
Table 2	7b	3.0	244	20
Table 4	18b (Comp)	0.0	438	n/a
Table 4	14b	2.0	326	26

To reiterate, there is no teaching in Ito et al. that would suggest that adding iron ions during the process of making water-absorbent polymer would result in reduced residual monomer content, and there is no disclosure or suggestion in Burgert et al. that would suggest that addition of a further additive such as iron ions would result in reduced residual monomer as found in the present invention.

Therefore, in view of the foregoing remarks, the rejection of Claims 1-7, 17-19, 21, and 27 under 35 U.S.C. § 103(a) as being unpatentable over Ito et al. in view of Burgert et al. should be withdrawn.

In light of the foregoing remarks and amendments to the claims, Applicant believes that the present application is now in condition for allowance, and such action is respectfully requested. If any issues remain unresolved, the Examiner is invited to telephone Applicant's counsel at the number provided below.

Respectfully submitted,

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Date: April 3, 2007

File No.: 5003073.091US2